

Wireless Home Phones and Femtocells in context of E9-1-1 Location Accuracy and Requiring Dispatchable Addresses and associated improved 9-1-1 Call Routing

Ex Parte, PS Docket No. 07-114, Texas 9-1-1 Entities

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Overview of Ex Parte

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I. Use cases explanation, Wireless Home Phone (WHP) and home femtocell, from September 2014 CSRIC Working Group 10 Report

The Communications Security, Reliability and Interoperability Council IV
Final Report

Working Group 10
September, 2014

Use Case 9 – Wireless Home Phone Devices

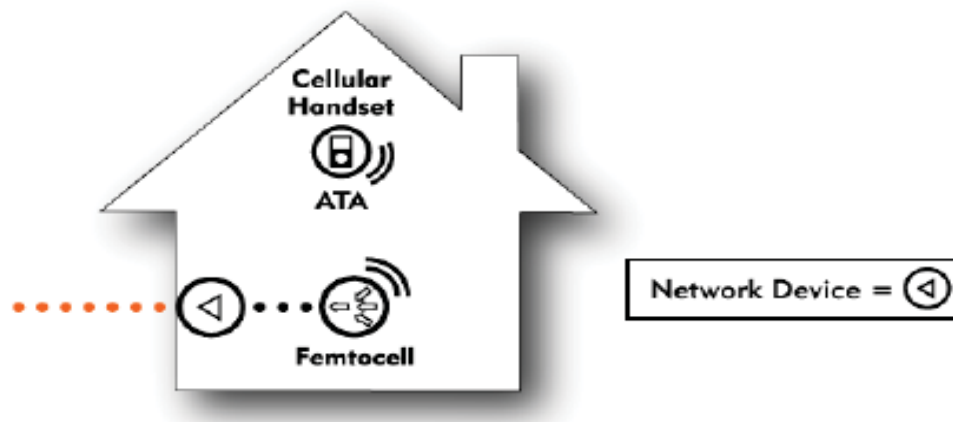


Deployment Description

This use case covers a range of wireless home phone devices containing a cellular radio, an ATA function, an antenna, RJ-11 POTS interface and integrated battery backup. The device is mounted conveniently in the home and relies on standard AC powering. These devices have become more prevalent in markets with good wireless coverage and in cases where the consumer is discontinuing their landline phone service. Consumers can then utilize standard cordless phones or standard POTS-type telephone devices in the home.

I. Use cases explanation, Wireless Home Phone (WHP) and home femtocell, from September 2014 CSRIC Working Group 10 Report (continued)

Use Case 8 Cellular Handset via Femtocell Base Station



Deployment Description

This use case uses a regular cellular phone in a home with poor cellular network coverage. Cellular voice is transmitted as IP over the homes broadband access network connection via a Femtocell. This use case is expected to increase dramatically as consumers shift to using mobile phones as their primary phone at home. The Femtocell base station connects to the network device via Ethernet. Today the Femtocell is typically not backed up with batteries. Mobile phones can connect to the outside cellular network during power failure, assuming sufficient outdoor coverage.

II. Use cases explanation, Consumer marketing and information

WHP Analog Telephone Adapters (ATAs) marketed very similar to home phone VoIP ATAs, for those people not wanting to have mobile handset only service.

In the video links below, respectively, if changed "AT&T Wireless Home Phone" to "Vonage Home Phone" and changed "wireless network" to "broadband connection" (as well as ignored VoIP marketing about being able to make calls from smartphone mobile handsets), it is difficult to distinguish much between the two home phone products – except that for E9-1-1 emergency calls VoIP falls under FCC Rule 9.5, while WHP may only fall, at least in part, only under FCC Rule 20.18 (excluding non-service initialized mobile handset 9-1-1 requirement).

<http://www.att.com/cellphones/att/att-wireless-home-phone.html#fbid=bCwGnip4mz3>

http://www.vonage.com/m_1/how_vonage_works.php

III. Use cases explanation, AT&T PSTN to IP Transition Docket, CC Docket No. 13-5

AT&T March 26, 2014 Ex Parte in CC Docket No. 13-5, Response to Questions 20 and 21:

20. On page 22 of its Operating Plan, AT&T states that it will upgrade the 911 capability of Wireless Home Phone by adding an ALI function to emulate the customer's experience with wireline TDM service. Is there an estimated timeline for obtaining this level of accuracy of location for Wireless Home Phone customers?

Answer: [**Begin Confidential**] [**End Confidential**]

21. The proposal also says that Wireless Home Phone subscribers will be able to update their address easily and accurately when the base station device has been moved to a new location. What are the methods for subscribers, including persons with disabilities, to easily update their address?

Answer: Customers will be able to update their location address by accessing a secure web site or by calling their AT&T customer care center.

VI. Use cases explanation, NENA, The Call, Tech Tends, Summer 2014

Caller Location Accuracy in a Different Light



Roger Hixson
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UNTIL GPS-BASED AND SIMILAR LOCATION TECHNOLOGY GETS DOWN TO THOSE RANGES, WE NEED TO SEE THAT CIVIC ADDRESS LOCATION CAPABILITIES DO NOT DISAPPEAR AS TECHNOLOGY CHANGES TAKE PLACE.

When caller location accuracy issues come up, it's usually in regard to cell phone callers. And that's a highly important set of topics. But there's another angle — the retention of specific caller location for 9-1-1 as wireline and equivalent services get converted to wireless connectivity. And we have some catch-up to do across all services that are not truly mobile.

In 2010, concerns developed on how femtocells and other forms of cellular range expansion devices provided caller location. NENA published an INFO document on this in early 2011. Since then, other devices to convert wireline phones to wireless connectivity have been rolled out by providers, with varied approaches to 9-1-1 caller location. Some utilize the known civic address location of the device, while others provide only X-Y coordinates in the same way as cellular phones working on main cellular towers. This changes the user's 9-1-1 location from their specific address to a more general X-Y, which is less consistent and specific than the former civic address location. These devices are marketed toward residential and small business users as a way to lower costs (and for the carrier, a way to reduce wireline service and move it into the wireless environment).

When these types of devices started coming out, I was concerned that another wave of specific civic address for fixed and nomadic services would become identifiable for 9-1-1 only as X-Y coordinates. Earlier this year, the FCC began to popularize concerns about accomplishing "dispatchable" addresses for 9-1-1 calling. This seemingly relates not only to accomplishing better caller location overall, but also the retention of previously accurate location, such as civic address info, as the "wireless conversion" desired by telephone carriers progresses.

There are other concerns in this area, such as setting objectives for caller location accuracy for Over The Top (OTT) providers and Internet-based fixed and nomadic services, such as VoIP. Seemingly, if no other criteria are set, providers and developers tend to focus on the easiest and/or most obvious location approach — either



user-provided address or GPS-generated X-Y info. Some have employed certain crosschecking methods, others have not. There remains a clear need to utilize the most automated and specific caller location technique, which as a "dispatchable" location likely means civic address, at least until such time as X-Y location approaches equivalent accuracy. The accuracy needs vary for residential lots, and sub-lots, to small business locations, and apartment locations. This varies from the 50-foot range down to a few feet, in order to differentiate between findable caller locations in these cases.

Until GPS-based and similar location technology gets down to those ranges, we need to see that civic address location capabilities do not disappear as technology changes take place. And any wireless range extension products that are placed at fixed locations, but don't provide that address to 9-1-1, need attention as well.

I have established a new issue on this topic in the NENA Development Group. We need to survey the products out there now and the new products as they appear, and work to re-emphasize expectations for 9-1-1 caller location consistency across all applicable fixed and nomadic services. If not, we will actually find ourselves moving backward in fixed and nomadic 9-1-1 caller location accuracy. ●

V. Texas 9-1-1 Entities, Initial Comments 07-114, May 12, 2014

One area deserving of near-term Commission action is in the rapidly expanding marketing of “wireless at home” landline replacement products, where the product is sold as a fixed, rather than mobile, service. At a minimum, providing a validated civic address should be the immediate expectation from the Commission’s order resulting from this proceeding. In the same way that seat belts are required in every automobile as the minimum acceptable level of service to protect the safety of the public, every home phone product must provide the same level of 9-1-1 service associated with the traditional landline service these products are intended to replace, in order to avoid a degradation in such service.

VI. NENA, Reply Comments 07-114, July 14, 2014

B. Changes in the structure of the residential telephone market should not be allowed to degrade 9-1-1 service.

NENA has grown particularly concerned that accelerating deployments of wireless home phone services are substantially degrading 9-1-1 service for consumers. Whether marketed as fixed wireline replacements or as quasi-nomadic network interface devices for legacy wireline handsets, these devices in many ways replicate the wireline telephone experience from the consumer standpoint. At the outset, it should have been clear to manufacturers and carriers that these devices would require differing treatment than truly mobile devices like ordinary wireless handsets. Instead, many such devices have failed to live up to the reasonable expectations of both consumers and public safety agencies in two critical respects. First, many such devices do not currently supply 9-1-1 systems with an MSAG-valid address when a user places a 9-1-1 call from an attached wireline or cordless telephone. Second, even where an address is supplied, mobile networks do not currently use it for routing purposes. These twin disappointments reduce the ability of public safety agencies to quickly locate res-

VI. NENA, Reply Comments 07-114, July 14, 2014 (continued)

idential telephone customers and, for a non-trivial fraction of calls, will significantly increase response time by requiring a call transfer.

To combat these problems, the Commission should clarify that fixed and nomadic wireless services are required to meet the same location accuracy and routing standards as the wireline services they are designed to replace. This can be accomplished in two ways: Initially, the Commission should establish a deadline by which such services must deliver an MSAG-valid address to the serving 9-1-1 system. To prevent data conflicts, the Commission should also require that providers corroborate the location of the device periodically, or at least at call-time, through some automated onboard means (e.g., a GNSS measurement, enhanced Cell ID record, etc.). Additionally, the Commission should establish a related deadline by which all such services must begin routing calls based on the service address. In adopting these requirements, the Commission should move swiftly: If it does not, the rapid deployment of devices with insufficient 9-1-1 capabilities could reach a critical mass that would long delay the restoration of key 9-1-1 service capabilities that should never have been ignored in the first place.

VII. Texas 9-1-1 Entities, Reply Comments 07-114, Appendix A, Figure 4, July 14, 2014

Figure 4 depicts an apartment complex. The larger circle has a radius of about 50 meters. The smaller circle has a radius of about 25 meters.



VIII. Texas 9-1-1 Entities, Reply Comments 07-114, Appendix B, July 14, 2014

APPENDIX B

Propose amending 20.18 to add new paragraphs (r), (s), and (t) as follows:

(r) Indoor location information address requirements under paragraph (d) of this section from a femtocell or small cell. CMRS providers subject to this section must identify an indoor femtocell or a small cell that they provisioned as an addition to their network to be the cell site or base station for purposes of the location requirements of paragraph (d) of this section and transmit the information to the PSAP as an address in accordance with the requirements of paragraph (d).

(s) Indoor location information dispatchable address requirements under paragraph (e) of this section from a non-mobile or portable wireless device sold as functionally equivalent to a fixed or nomadic indoor local exchange service or interconnected voice over internet protocol service or from a femtocell. In addition to providing the location of all 911 calls by longitude and latitude, CMRS providers subject to this section must provide the location information dispatchable address identifying an indoor femtocell that they provisioned as an addition to their network or identifying a non-mobile or portable wireless device sold as functionally equivalent to a fixed or nomadic indoor local exchange service or interconnected voice over internet protocol service (e.g. wireless home phone service) consistent with and meeting the requirements of rule 9.5 applicable to Interconnected VoIP 9-1-1 in order to comply with and satisfy the location requirements of paragraph (e) of this section and transmit such to the PSAP as the location information dispatchable address in accordance with the requirements of paragraph (e), and notwithstanding paragraph (e) or (r), route 9-1-1 calls to the same designated PSAP as 9-1-1 calls from Interconnected VoIP under rule 9.5 unless specifically requested to do otherwise by the authority for the designated PSAP.

(t) Supplemental outdoor and indoor location information requirements under paragraphs (d) and (e) of this section. CMRS providers subject to this section must provide the following supplemental information comparable to a local exchange service or interconnected voice over internet protocol service and transmit such to the PSAP as part of complying with and satisfying the location information requirements of paragraphs (d) or (e) of this section:

- (1) Customer name information associated with the account or telephone number;
- (2) Billing address information associated with the account or telephone number, except in cases subject to the requirements of paragraph (s) for dispatchable location address information or in other cases where dispatchable location address information is voluntarily provided.

IX. Texas 9-1-1 “Draft” comparison matrix for discussion purposes between ESRK, ESQK, and Legacy Wireline E9-1-1 solutions for WHP

While no wireless carrier (as a wireless carrier) has yet to our knowledge deployed for these fixed or portable nomadic devices any of the three existing current civic address ALI provisioning methods (i.e., legacy wireline static civic address ALI; ESQK civic address ALI in use for fixed and nomadic VoIP; and ESRKs which have been used in the past for services, such as T-Mobile@Home service), *if* wireless carriers (as wireless carriers) were to start provisioning civic address ALI with any one of the three existing civic address ALI provisioning methods, there could be potential tradeoff considerations on some relevant issues between the three existing civic address ALI provisioning methods, and such are set forth in the following matrix.

IX. Texas 9-1-1 “Draft” comparison matrix for discussion purposes between ESRK, ESQK, and Legacy Wireline E9-1-1 solutions for WHP (continued)

Issues	ESRK Option	ESQK Option	Legacy Wireline
MSAG valid civic location ALI	Yes	Yes	Yes
MSAG valid civic location for SR	No (if ESQKs are cell sector based)	Yes (but PSAPs that have not already done so may need to provide more granular map data to VPCs for shapefile overlap boundary areas)	Yes
Customer Name	Unknown or yet to be determined	Yes	Yes
ANI or pANI for ALI Query	pANI	pANI	ANI
Default 9-1-1 Trunk Group Routing	Wireless Phase I based (if ESQKs are cell sector based)	Can mimic wireline based (if desired and currently different than wireline based)	Wireline based at least within existing wireline footprint which may not cover wireless footprint

IX. Texas 9-1-1 "Draft" comparison matrix for discussion purposes between ESRK, ESQK, and Legacy Wireline E9-1-1 solutions for WHP (continued)

Phase I cell tower course location displayed		No, have actual MSAG valid civic location; therefore, no need for course location display		No		No		
Phase II, X, Y location displayed, if not currently being used in mobile manner		No, have actual MSAG valid civic location; therefore, no need for Phase II X, Y location display		No		No		
Near-Real time Address Updating for Nomadic Use		Yes, should be able to be done similar to Nomadic VoIP if MPC is capable		Yes, done today for Nomadic VoIP		No or not likely, static ALI database update may be too infrequent for a Nomadic service		
Ability to accommodate non-geographic rate center based telephone numbers		Yes, use of pANI make an ANI outside specific areas a non-issue		Yes, use of pANI make an ANI outside specific areas a non-issue		No, not likely or cleanly, FX might work in some limited cases		
Class of Service (COS)		New COS, such as WFIXED would be needed to distinguish from x, y ESRK wireless 9-1-1 calls		VoIP, VRES, VBUS		RES, BUS		

IX. Texas 9-1-1 “Draft” comparison matrix for discussion purposes between ESRK, ESQK, and Legacy Wireline E9-1-1 solutions for WHP (continued)

English Language Translations (ELTs)		Verify, Verify, Verify		Wireline ELTs can be available if ESQKs with wireline ELTs have been deployed		Wireline ELTS	
Automatic Selective Transfer Feature Availability		No -- because using Verify, Verify, Verify ELTS		Yes or no, depending on if ESQKs for wireline ELTs have been deployed		Yes, based on Wireline ELTS	
Included in existing PSAP Legacy ALI database statics and quality control processes		Not included as part of legacy ALI metrics because not in legacy ALI database		Not included as part of legacy ALI metrics because not in legacy ALI database		Yes, where they exists for legacy wireline	
Available in existing ECATS type data quality statistics		Yes, no change		Yes, no change		Yes, no change	

IX. Texas 9-1-1 "Draft" comparison matrix for discussion purposes between ESRK, ESQK, and Legacy Wireline E9-1-1 solutions for WHP (continued)

ALI (or V-ALI) data available for Emergency Notification Service (ENS)		Yes, can be made available similar to V-ALI upon request		Yes, V-ALI data is available per request under federal law		Yes, ALI data is available per request under federal law (and perhaps state as well)	
Legacy Manual ALI Query Available		No, but could have ENS data available		No, but could have ENS data available		Yes	
Potential new Network, CPE, and/or Mapping Issues		If wireless 9-1-1 trunks and/or ESRKs are used, then would need to evaluate potential individual PSAP 9-1-1 network, CPE, and/or Mapping issues from using MSAG civic addresses with wireless 9-1-1 trunks or ESRKs		None expected		None expected	
NENA Company ID		Wireless Carrier NENA ID		Wireless Carrier NENA ID		Wireline Carrier NENA ID?	
Special Geographic Limitations and Constraints		None expected, should be available in entire wireless carrier footprint		None expected, VPCs should be generally available in entire wireless carrier footprint		May only be available to wireless carrier that is also an ILEC in the same areas	